

**Claims:**

1. An on-line print network comprising a plurality of computer entities connected by a communications network, for providing on-line print services, said  
5 print network comprising:

a print merchant computer entity capable of receiving orders for print items over said communications network;

10 a plurality of print manager computer entities, each said print manager computer entity in communication with said print merchant computer entity over said communications network;

a plurality of printer devices, wherein one or more said printer devices are  
15 connected to one or more said print manager computer entities,

wherein said printer devices receive instructions for printing a plurality of print products, from a said print manager computer entity, said print manager computer entity instructing said printer devices in response to an order for print  
20 items received from said print merchant computer entity.

2. The print network as claimed in claim 1, wherein a said print manager computer entity, on receiving a said order, splits said order into a plurality of print jobs each comprising a plurality of individual print items, and  
25 allocates said plurality of jobs to at least one said printer device.

3. The print network as claimed in claim 1, wherein a said print manager computer entity distributes a plurality of print items on at least one two-dimensional sheet material, in a manner which optimizes usage of an area of  
30 said sheet material.

4. The print network as claimed in claim 1, wherein a said print manager computer entity distributes a plurality of print items amongst a plurality of said printer devices, in a manner which optimizes usage of print media in use on each of said plurality of print devices, to minimize changes of said print media on said plurality of printer devices.

5. The print network as claimed in claim 1, wherein a said print manager computer entity distributes a plurality of print items amongst said plurality of printer devices in a manner which optimises changes of ink sets on said plurality of printer devices.

6. The print network as claimed in claim 1, further comprising a backtracking algorithm for arranging a plurality of different print items to print on at least one print media, in a manner which optimizes area usage of said at least one print media.

7. The print network as claimed in claim 1, wherein said print manager computer entity operates to balance a workload of print jobs amongst said plurality of printer devices.

8. The print network as claimed in claim 1, wherein a said print manager computer entity allocates print items to said plurality of printer devices based upon criteria selected from the set:

sheet material type loaded onto a said printer device;

ink type loaded into a said printer device;

percentage utilization of a said printer device;

efficiency of sheet material area usage on a said printer device.

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9. A print service provider operation comprising:

at least one print manager computer entity, and

5 a plurality of printer devices,

said print manager computer entity operating to receive an electronic order for print items, said order comprising one or a plurality of print jobs each representing at least one print item to be printed, said print manager computer  
10 entity operating to distribute a plurality of print images on at least one two-dimensional print media, in a manner which optimizes usage of an area of said print media.

10. A method of providing on-line print services, said method  
15 comprising the steps of:

receiving at least one order for print products on-line;

electronically distributing said at least one order to at least one print service  
20 provider facility;

within a said print service provider facility, electronically allocating said order to at least one printer device; and

25 printing at least one print item according to said order.

11. The method as claimed in claim 10, comprising the step of:

dividing said order into a plurality of jobs, each said job comprising a  
30 plurality of individual print items; and

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allocating said plurality of jobs amongst at least one said printer device.

12. The method as claimed in claim 10, further comprising:

5 allocating a plurality of said print items to a plurality of printer devices, taking into account for each printer device, parameters selected from the set:

availability of said printer device;

10 a sheet material type loaded onto said printer device;

an ink type loaded onto said printer device;

a percentage utilization of said printer device.

15 13. The method as claimed in claim 10, comprising the step of:

distributing a plurality of said print items on at least one two-dimensional  
sheet material, in a manner which optimizes usage of an area of said sheet  
20 material.

14. A method of allocating a plurality of print items amongst a plurality  
of printer devices comprising:

25 receiving an order for a plurality of print items to be printed; and

distributing said plurality of print items amongst said plurality of printer  
devices in a manner which optimizes usage of said plurality of printer devices.

30 15. The method as claimed in claim 14, comprising the step of:

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electronically arranging a plurality of virtual print items on at least one virtual media sheet; and

re-sorting said plurality of virtual print items amongst said at least one virtual media sheet according to a sorting algorithm.

16. The method as claimed in claim 14, comprising the step of:

electronically arranging a plurality of virtual print items on at least one virtual media sheet; and

re-sorting said plurality of virtual print items amongst said at least one virtual media sheet according to a backtracking algorithm.

17. The method as claimed in claim 14, comprising the step of:

electronically arranging a plurality of virtual print items on at least one virtual media sheet; and

re-sorting said plurality of virtual print items amongst said at least one virtual media sheet in a manner which minimizes a number of cuts applied to said at least one virtual media sheet.

18. The method as claimed in claim 14, wherein said step of distributing said plurality of print items comprises:

distributing said plurality of print items amongst said plurality of printer devices in a manner which optimizes usage of a print media loaded into said plurality of print devices.

19. The method as claimed in claim 14, wherein said step of distributing said plurality of print items comprises:

5 distributing said plurality of print items amongst said plurality of printer devices in a manner which optimizes allocation of print items to individual said printer devices on the basis of achieving a lowest time to print said plurality of print items.

20. The method as claimed in claim 14, wherein said step of distributing said plurality of print items comprises:

10 distributing said plurality of print items amongst said plurality of printer devices in a manner which optimizes allocation of print items to individual ones of said plurality of printer devices on a combination of,

15 reducing media wastage; and

reducing a time to print said plurality of print items.

21. An on-line print network comprising a plurality of computer entities connected by a communications network, for providing on-line print services, said  
20 print network comprising:

a print merchant computer entity capable of receiving orders for print items over said communications network;

25 a plurality of print manager computer entities, each said print manager computer entity in communication with said print merchant computer entity over said communications network;

30 a plurality of printer devices, wherein one or more said printer devices are connected to one or more said print manager computer entities,

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wherein said plurality of printer devices receive instructions for printing a plurality of print products, from a said print manager computer entity, said print manager computer entity instructing said plurality of printer devices in response to an order for print items received from said print merchant computer entity;

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on receiving said order for print items, said print manager computer entity splits said order into a plurality of print jobs, each comprising a plurality of individual print items, and allocates said plurality of print jobs to at least one said printer device of said plurality of printer devices, in a manner which balances distribution of said print jobs amongst said plurality of printer devices.

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22. An on-line print network comprising a plurality of computer entities connected by a communications network, for providing on-line print services, said print network comprising:

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a print merchant computer entity capable of receiving orders for print items over said communications network;

a plurality of print manager computer entities, each said print manager computer entity in communication with said print merchant computer entity over said communications network;

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a plurality of printer devices, wherein one or more said printer devices are connected to one or more said print manager computer entities,

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wherein said plurality of printer devices receive instructions for printing a plurality of print products, from a said print manager computer entity, said print manager computer entity instructing said plurality of printer devices in response to an order for print items received from said print merchant computer entity;

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wherein a said print manager computer entity on receiving said order for print items, splits said order into a plurality of print items, and distributes said

plurality of print items amongst a plurality of said printer devices in a manner which minimises changes of said print media on said plurality of printer devices, and which minimises changes of ink sets on said plurality of printer devices.

5        23.     A method of providing on-line print services, said method comprising the steps of:

receiving a plurality of orders for print products on-line;

10        electronically distributing said plurality of orders to at least one print service provider facility;

within a said print service provider facility, electronically allocating a said order to at least one printer device of a plurality of printer devices , in a manner  
15        which minimises changes of said print media on said plurality of printer devices, and minimises changes of ink sets on said plurality of printer devices; and

printing at least one print item according to said order.

20        24.     A method of providing on-line print services, said method comprising the steps of:

receiving a plurality of orders for print products on-line;

25        electronically distributing said plurality of orders to at least one print service provider facility;

within a said print service provider facility, electronically allocating a said order to at least one printer device of a plurality of printer devices, in a manner  
30        which balances a printing workload amongst said plurality of printer devices; and

printing at least one print item according to said order.



25. A method of allocating a plurality of print items amongst a plurality of printer devices comprising:

5 receiving an order for a plurality of print items to be printed;

distributing said plurality of print items amongst said plurality of printer devices in a manner which optimizes a combination of:

10 reducing media wastage; and

reducing a time to print said plurality of print items.

26. A print service provider operation comprising:

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at least one print manager computer entity operating to receive an electronic order for print items, said order comprising one or a plurality of print jobs each representing at least one print item to be printed; and

20 a plurality of printer devices capable of receiving instructions from said print manager computer entity for printing a plurality of print products,

25 wherein said print manager computer entity operates to distribute a plurality of print images to be printed on at least one two dimensional media, in a manner which optimises usage of an area of said at least one two dimensional media, said distribution of said plurality of print images being allocated taking into account, for each printer device, parameters selected from the set;

30 a sheet material type loaded onto said printer device;

a number of cuts applied to a said at least one sheet material, loaded onto said printer device.